Antibacterial Effect of Extracts and Essential Oils from Three Plants on Growth of Enterohemorrhagic Escherichia coli O157:H7 and DNase Activity in Staphylococcus aureus

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Background & Objectives: *Staphylococcus aureus* is one of the most frequently identified pathogens in clinical laboratories and DNase is one of its important virulence factors. It is a frequent cause of medical device-related infections such as intravascular line sepsis and prosthetic joint infections. *E. coli* O157:H7and other Shiga toxin-producing *E. coli* (STEC) strains haveemerged in recent years as important human pathogens associatedwith a spectrum of diseases ranging from diarrhea to hemorrhagic colitis and hemolytic-uremic syndrome (HUS). Studies confirm that the growth of both gram-positive and gram-negative foodborne bacteria can be inhibited by some herbs. *Staphylococcus aureus* and *E. coli* O157:H7 can develop drug resistance to many chemical drugs so; considerable effort has been expanded by investigators in the development of herbal drugs.

Methods: Black pepper, Red pepper and Thyme were provided from the Iranian agricultural researches center. Plants were examined for determining their major components and essential oils were separated. The inhibitory effect of extracts and essential oils were tested by the agar - well - diffusion assay. The extracts and oils that showed antimicrobial activity were later tested to determine the Minimum Inhibitory Dilution (MID).

Results: In our study it was deduced that extracts and essential oils of Black pepper, Red pepper and Thyme can play a significant role in inhibition of *Escherichia coli* O157:H7 and *Staphylococcus aureus* .They can inhibit release of *Staphylococcus aureus* DNase enzyme in the dilutions lower than minimum inhibitory dilution (MID).

Conclution: Such plants should be investigated to better understand their properties, safety and efficiency. They can be used in the treatment of infectious diseases caused by resistant microbes. Additional clinical trials of these oils have to be performed if they are to be used for medicinal purposes.

Keywords: *Escherichia coli* O157:H7; *Staphylococcus aureus*; DNase Activity; Black Pepper; Red Pepper; Thyme